

This listing of claims will replace all prior versions, and listings, of claims in the application:

Amendments to the claims

Claims 1-20 (canceled).

Claim 21 (new): A method of maintaining the life of a porous filter when refining a metal melt by controlling the formation of a filter cake thereon, the method comprising passing liquid metal through a porous filter and adding a filter cake formation agent to the metal; contacting the filtered metal with a grain refining agent followed by mechanical mixing to promote intimate mixing of the metal and the grain refining agent to produce refined metal, whereby a filter cake is formed on the porous filter without significant change in the metallostatic head above the filter.

Claim 22 (new): A method as claimed in Claim 1, wherein the metal to be refined is a light metal such as aluminium or an alloy comprising aluminium.

Claim 23 (new): A method as claimed in Claim 1, in which the porous filter comprises a ceramic block or plate.

Claim 24 (new): A method as claimed in Claim 1, in which the pore dimensions of the porous filter are in the range of about 300 to about 2,500 micron.

Claim 25 (new): A method as claimed in Claim 1, in which the filter cake formation agent consists of particles coated with substances wetted by the liquid metal and/or containing a fluxing agent such as a fluoride.

Claim 26 (new): A method as claimed in Claim 1, in which the filter cake becomes formed in layers which are non-compressible.

Claim 27 (new): A method as claimed in Claim 1, in which the porous filter is located in one chamber separated from another chamber into which the grain refining agent is introduced.

Claim 28 (new): A method as claimed in Claim 7, in which the said chambers are adjacent.

Claim 29 (new): A method as claimed in Claim 7, in which the grain refining agent is fed into the said another chamber countercurrent to the direction of flow of the liquid metal.

Claim 30 (new): A method as claimed in Claim 1, wherein particulates greater than 40 micron in size are substantially removed from the grain refined metal.

Claim 31 (new): A method of maintaining the life of a porous filter when refining a metal melt by controlling the formation of a filter cake thereon, the method comprising passing liquid metal through a porous filter and adding a filter cake formation agent to the metal; contacting the filtered metal with a grain refining agent followed by flow modification to promote intimate mixing of the metal and the grain refining agent to produce refined metal, whereby a filter cake is formed on the porous filter without significant change in the metallostatic head above the filter.

Claim 32 (new): A method as claimed in Claim 11, wherein the metal to be refined is a light metal such as aluminium or an alloy comprising aluminium.

Claim 33 (new): A method as claimed in Claim 11, in which the porous filter comprises a ceramic block or plate.

Claim 34 (new): A method as claimed in Claim 11, in which the pore dimensions of the porous filter are in the range of about 300 to about 2,500 micron.

Claim 35 (new): A method as claimed in Claim 11, in which the filter cake formation agent consists of particles coated with substances wetted by the liquid metal and/or containing a fluxing agent such as a fluoride.

Claim 36 (new): A method as claimed in Claim 11, in which the filter cake becomes formed in

layers which are non-compressible.

Claim 37 (new): A method as claimed in Claim 11, in which the porous filter is located in one chamber separated from another chamber into which the grain refining agent is introduced.

Claim 38 (new): A method as claimed in Claim 17, in which the said chambers are adjacent.

Claim 39 (new): A method as claimed in Claim 17, in which the grain refining agent is fed into the said another chamber countercurrent to the direction of flow of the liquid metal.

Claim 40 (new): A method as claimed in Claim 11, wherein particulates greater than 40 micron in size are substantially removed from the grain refined metal.

Claim 41 (new): A method of refining a metal melt comprising passing liquid metal through a porous filter whilst adding filter cake forming agent to a flow of liquid metal, subjecting the filtered metal to grain refinement by addition of grain refining agent with simultaneous admixing of liquid metal with said grain refining agent followed by separation of at least some particulate matter from the flow of liquid metal characterised in that the liquid metal flow is subjected to only one filtration stage.

Claim 42 (new): A method as claimed in Claim 21, in which the admixing of liquid metal and/or separation of particulate matter is effected through liquid metal flow modification.

Claim 43 (new): A method as claimed in Claim 21, wherein the metal to be refined is a light metal such as aluminium or an alloy comprising aluminium.

Claim 44 (new): A method as claimed in Claim 21, in which the porous filter comprises a ceramic block or plate.

Claim 45 (new): A method as claimed in Claim 21, in which the pore dimensions of the porous

filter are in the range of about 300 to about 2,500 micron.

Claim 46 (new): A method as claimed in Claim 21, in which the filter cake formation agent consists of particles coated with substances wetted by the liquid metal and/or containing a fluxing agent such as a fluoride.

Claim 47 (new): A method as claimed in Claim 21, in which the filter cake becomes formed in layers which are non-compressible.

Claim 48 (new): A method as claimed in Claim 21, in which the porous filter is located in one chamber separated from another chamber into which the grain refining agent is introduced.

Claim 49 (new): A method as claimed in Claim 28, in which the said chambers are adjacent.

Claim 50 (new): A method as claimed in Claim 28, in which the grain refining agent is fed into the said another chamber countercurrent to the direction of flow of the liquid metal.

Claim 51 (new): A method as claimed in Claim 21, in which separation of said particulate matter is achieved by the presence of baffle plates modifying the path of flow of the liquid metal.

Claim 52 (new): A method as claimed in Claim 21, in which separation of said particulate matter is achieved in means generating swirl flow in the liquid metal, such as within a cyclone.

Claim 53 (new): A method as claimed in Claim 21, wherein particulates greater than 40 micron in size are substantially removed from the grain refined metal.

Claim 54 (new): Apparatus constructed and arranged to carry into effect a method as claimed in Claim 1, comprising a primary compartment to receive an inlet flow of liquid metal and including filtration means in the form of a porous filter adapted to support, in use, a build-up of filter cake, means for introducing into the said primary compartment filter cake controlling agent and a

secondary compartment adjacent to or spaced from the primary compartment to receive a flow of filtered liquid metal and including an inlet for grain refining agent, the apparatus being constructed or incorporating means to cause admixing of the flowing filtered liquid metal with introduced grain refining agent, and further constructed to or incorporating means to separate at least some particulate matter from the filtered and grain refined liquid metal flow after admixture with the grain refining agent, the apparatus being characterised by a single filtration means.

Claim 55 (new): Apparatus as claimed in Claim 34, in which the porous filter is located at and defines the base of the metal feed inlet compartment within the primary chamber.

Claim 56 (new): Apparatus as claimed in Claim 34, in which the grain refining agent inlet is angled at an acute angle with respect to the secondary compartment to cause intimate admixture of the grain refining agent with flowing filtered liquid metal.

Claim 57 (new): Apparatus as claimed in Claim 34, including a plurality of baffle plates situated to effect modification to the flow of liquid metal towards an exit of the apparatus.

Claim 58 (new): Apparatus as claimed in Claim 34, including a means for generating swirl flow to induce separation of at least some particulate matter, in use, from flowing filtered and grain refined liquid metal.

Claim 59 (new): Apparatus constructed and arranged to carry into effect a method as claimed in Claim 11, comprising a primary compartment to receive an inlet flow of liquid metal and including filtration means in the form of a porous filter adapted to support, in use, a build-up of filter cake, means for introducing into the said primary compartment filter cake controlling agent and a secondary compartment adjacent to or spaced from the primary compartment to receive a flow of filtered liquid metal and including an inlet for grain refining agent, the apparatus being constructed or incorporating means to cause admixing of the flowing filtered liquid metal with introduced grain refining agent, and further constructed to or incorporating means to separate at least some particulate matter from the filtered and grain refined liquid metal flow after admixture with the grain refining

agent, the apparatus being characterised by a single filtration means.

Claim 60 (new): Apparatus as claimed in Claim 39, in which the porous filter is located at and defines the base of the metal feed inlet compartment within the primary chamber.

Claim 61 (new): Apparatus as claimed in Claim 39, in which the grain refining agent inlet is angled at an acute angle with respect to the secondary compartment to cause intimate admixture of the grain refining agent with flowing filtered liquid metal.

Claim 62 (new): Apparatus as claimed in Claim 39, including a plurality of baffle plates situated to effect modification to the flow of liquid metal towards an exit of the apparatus.

Claim 63 (new): Apparatus as claimed in Claim 39, including a means for generating swirl flow to induce separation of at least some particulate matter, in use, from flowing filtered and grain refined liquid metal.

Claim 64 (new): Apparatus constructed and arranged to carry into effect a method as claimed in Claim 21, comprising a primary compartment to receive an inlet flow of liquid metal and including filtration means in the form of a porous filter adapted to support, in use, a build-up of filter cake, means for introducing into the said primary compartment filter cake controlling agent and a secondary compartment adjacent to or spaced from the primary compartment to receive a flow of filtered liquid metal and including an inlet for grain refining agent, the apparatus being constructed or incorporating means to cause admixing of the flowing filtered liquid metal with introduced grain refining agent, and further constructed to or incorporating means to separate at least some particulate matter from the filtered and grain refined liquid metal flow after admixture with the grain refining agent, the apparatus being characterised by a single filtration means.

Claim 65 (new): Apparatus as claimed in Claim 44, in which the porous filter is located at and defines the base of the metal feed inlet compartment within the primary chamber.

Claim 66 (new): Apparatus as claimed in Claim 44, in which the grain refining agent inlet is angled at an acute angle with respect to the secondary compartment to cause intimate admixture of the grain refining agent with flowing filtered liquid metal.

Claim 67 (new): Apparatus as claimed in Claim 44, including a plurality of baffle plates situated to effect modification to the flow of liquid metal towards an exit of the apparatus.

Claim 68 (new): Apparatus as claimed in Claim 44, including a means for generating swirl flow to induce separation of at least some particulate matter, in use, from flowing filtered and grain refined liquid metal.